REMARKS

Provided below are Applicant's remarks in reply to the Office Action of July 28, 2005.

Section 103 Rejection

Claims 5-8, 16 and 32-36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (U.S. Patent No. 6,550,263, hereafter "Patel") in view of Smith et al. (U.S. Patent No. 6,184,065, hereafter "Smith"). This rejection is maintained from previous Office Action. In response to Applicant's previous arguments filed July 18, 2005, the present Office Action in paragraph 1 makes additional remarks. Applicant traverses these additional remarks as addressed to follow:

First, the Office Action states that although Patel does not provide a written description of their invention as teaching "a continuous flow or immersing die in fluid," its Figs. 5 and 6 show the following. Initially, the Office Action states that Figs. 5 and 6 show chips 401(501) being raised above the substrate 403 (517) with a gap between them. The Office Action continues stating that both Figures show a liquid outlet pipe 413 (523) located on a bottom level of the cavity 415 (527), which inherently means that chips 401 (501) are directly cooled by a coolant on both sides including interconnections with the substrate. The Office Action concludes stating, "Hence, examiner does not agree with applicant's statement that: 'Patel does not teach or suggest a continuous flow, or immersing die in fluid, as claimed.'"

In response, Applicant maintains that the Office Action has still not shown 'a continuous flow" as claimed in claims 5 and 7. The chips 401(501) being raised above the substrate 403(517) with a gap between do not disclose any continuous coolant flow. Similarly, the liquid outlet pipe 413 (523) located on a bottom level of the cavity 415(527) does not disclose any continuous coolant flow comes from the pipe. As Patel states,

"Preferably, the spray mechanism 105 is an incremental sprayer configured to eject an incremental amount of cooling fluid on the chips." See Patel, col. 5, lines 36-38. Patel, thus, does not teach or suggest a continuous fluid flow as claimed in claims 5 and 7. Accordingly, the remaining claims 5 and 7, and their respective dependent claims 32, 34 and 36 are believed allowable as non-obvious over Patel in view of Smith.

In response further, specifically regarding claims 8, 16 and 33, Applicant maintains that the coolant in Patel does not contact the die at all, much less on a particular surface. Instead, Patel discloses a packaged die as "chip" 401 with leads extending from the "chip" 401 into the substrate 403. See Patel col. 8, lines 16-24. The chip 401 is a component containing a die and no coolant ever directly contacts the die within the package as indicated in claims 8 and 16. Further, the leads of the chip are 401 not removable from the die as claimed in claim 33. Accordingly claims 8, 16 and 33 are believed allowable as non-obvious over Patel in view of Smith.

Second, the Office Action first states that unlike related application 10/026,471 the instant application does not teach the claimed structure as a probe or testing device. In response, Applicant maintains that none of applicant's pending claims directly address a probe or testing device. Accordingly, Applicant does not further address this argument.

Second further, the Office Action responds to Applicant's argument that there is no motive to combine Smith and Patel, stating that there are two: First, to make possible for a coolant to directly cool interconnections and an active bottom of the dies, and second to provide easy disassembling. The Office Action states that based on these motivations the combination of Smith and Patel makes sense and the rejection stays.

In response, Applicant maintains that substituting the leads of chip 401 of Patel with compliant interconnects of Smith, as described in the Office Action, makes no sense because the chip leads would flex and no longer be easily insertable into the substrate 403. The motives of the Office Action to (1) directly cool all sides of a die, and (2) provide easy

disassembling do not address the issue that the compliant interconnects of Smith used as leads of chip 401 would not make it non-insertable. Thus, neither Office Action motive would provide a reasonably functional device with compliant interconnects that can be inserted into the substrate if Patel and Smith are combined. In further contrast with the Office Action motives, cooling of all sides of a die can be done with the rigid interconnects of Patel, and easy of disassembly can be provided with rigid interconnects just as easily as compliant interconnects, so there is no need to look past the rigid contacts of Patel to use the compliant contacts of Smith. Thus, Applicant still maintains that there is no motivation for a person of ordinary skill to combine Patel and Smith to form applicant's claimed invention as indicated by the Office Action. Claims 5-8, 16 and 32-36 are, therefore, further believed allowable as non-obvious over Patel in view of Smith.

Allowable Claims

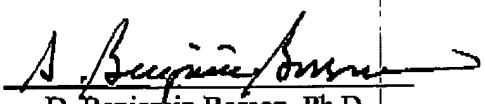
Claims 17, 20-21 and 25-26 are indicated by the Office Action as allowed.

Conclusion

In light of the above amendments and remarks, claims 5-8, 16-17, 20-21, 25-26 and 32-36 are now all believed to be in condition for allowance. Accordingly, reconsideration and allowance of these claims is respectfully requested.

Respectfully submitted,

Date: December 28, 2005

By: 
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